

between hydrogen sulfide and sulfur dioxide to form a product gas effluent comprising elemental sulfur and water; cooling the product gas effluent to condense and separate elemental sulfur from the product gas effluent and form a tail gas effluent;

combusting a portion of the tail gas effluent with a source of oxygen in a combustion zone to oxidize sulfur species present in the tail gas effluent and form a combustion gas effluent comprising sulfur dioxide;

contacting the combustion gas effluent with a liquid absorbent for sulfur dioxide in a sulfur dioxide absorption zone to selectively transfer sulfur dioxide from the combustion gas effluent to the absorbent and produce an exhaust gas from which sulfur dioxide has been substantially removed and a sulfur dioxide-rich absorbent;

stripping sulfur dioxide from the rich absorbent in a sulfur dioxide stripping zone to produce a lean absorbent and a sulfur dioxide-enriched stripper gas; 25

recycling the lean absorbent to the sulfur dioxide absorption zone for further selective absorption of sulfur dioxide from the combustion gas effluent; and

mixing the sulfur dioxide-enriched stripper gas with at least a portion of the acid gas feed stream and the remainder of the tail gas effluent to form the feed gas mixture introduced into the Claus catalytic reaction zone, the proportion of the tail gas effluent introduced into the Claus catalytic reaction zone as part of the feed gas mixture being sufficient to moderate the temperature within the Claus catalytic reaction zone.

Please amend claim 26 as follows:

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26. (once amended) The process as set forth in claim 1 wherein the acid gas feed stream further comprises an unsaturated hydrocarbon component selected from the group consisting of linear olefins, branched olefins, aromatic hydrocarbons and mixtures thereof, the process further comprising pretreating the acid gas feed stream upstream of the Claus catalytic reaction zone to reduce the concentration of the unsaturated hydrocarbon component and inhibit deactivation of the Claus conversion catalyst, pretreatment of the acid gas feed stream comprising:

contacting at least a portion of the acid gas feed stream with an aqueous acid wash to react unsaturated hydrocarbons with the acid and form an addition reaction product; and

separating the addition reaction product from the acid gas feed stream.

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